


# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 5348999		<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/GB00/02501	International filing date (day/month/year) 23/06/2000	Priority date (day/month/year) 25/06/1999	
International Patent Classification (IPC) or national classification and IPC B01J19/00			
Applicant AVANTIUM INTERNATIONAL B.V.			
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of 6 sheets.</p>			
<p>3. This report contains indications relating to the following items:</p> <ul style="list-style-type: none"> <li>I <input checked="" type="checkbox"/> Basis of the report</li> <li>II <input type="checkbox"/> Priority</li> <li>III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</li> <li>IV <input type="checkbox"/> Lack of unity of invention</li> <li>V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</li> <li>VI <input type="checkbox"/> Certain documents cited</li> <li>VII <input type="checkbox"/> Certain defects in the international application</li> <li>VIII <input checked="" type="checkbox"/> Certain observations on the international application</li> </ul>			
Date of submission of the demand  15/01/2001		Date of completion of this report  24.09.2001	
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465		Authorized officer  Nazario, L  Telephone No. +49 89 2399 8137	



# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB00/02501

## I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

### Description, pages:

3-15	as originally filed			
1,2	as received on	02/07/2001	with letter of	26/06/2001

### Claims, No.:

1-32	as received on	02/07/2001	with letter of	26/06/2001
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### Drawings, sheets:

1/3-3/3	as originally filed
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2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/GB00/02501

- ☐ the description, pages:  
☐ the claims, Nos.:  
☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Yes:	Claims 3, 5, 8-9, 13-14, 16-17, 20-27 and 31-32
	No:	Claims 1, 2, 4, 6, 7, 10-12, 15, 18, 19, 24 and 28-30
Inventive step (IS)	Yes:	Claims
	No:	Claims 1-32
Industrial applicability (IA)	Yes:	Claims 1-32
	No:	Claims

2. Citations and explanations  
**see separate sheet**

**VIII. Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:  
**see separate sheet**

**R Item V**

**Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Reference is made to the following documents:

D1: WO-A-98 56506  
D2: WO-A-98 17391  
D3: EP-A-0 916 397  
D4: GB-A-2 291 820  
D5: WO-A-99 24160

2. D1-D5 disclose devices for holding vessels which comprise holding means with openings, connecting means and reactor vessels. These devices are used in a variety of processes, such as chemical synthesis.

The disclosed devices also include connection means located in recesses (e.g. gaskets or O-rings) which form leak-tight seals. In D1, such a seal is produced by placing a support plate over the multiple-vessel holding means (see, for example, figures 1 and 3). In D2-D4, the connections means (e.g. O-rings) are not placed between a support plate and a holding means, but located withing the holding means (D2, figure 2, reference 34; D3, figure 2, reference 33; D4, figure 2c, reference 12).

The reactors vessels are disclosed as being made out of glass and the devices can carry out heating, mixing and cooling processes. D1 further discloses a support plate, cover means and manifolds. D3 discloses cover means, as well as, relief valves, manifolds, condensing means and stirrer means. (D1: abstract, page 1, lines 21-26, page 10, line 31 to page 13, line 20, page 14, lines 10-13, figures 1, 3, 7, 17; D2: abstract, page 1, lines 2-6, page 6, line 28 to page 7, line 13, page 8, line 1 to page 9, line 33, page 13, lines 1-36, page 18, lines 4-16, figures 1, 2, 5, 7; D3: abstract, page 1, lines 5-7 and 47-50, page 4 line 28 to page 5, line 56, page 6, lines 22-25, page 7, lines 13-20, page 8, lines 2-17, figures 2, 3, 6, 8; D4 abstract, page 1, lines 5-20, page 2, lines 1-22, figures; D5: abstract, page 1, lines 4-12, page 3, lines 10-19, page 9, line 10 to page 10, line 27, figure 2).

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

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Therefore, the subject-matter of independent claims 1 and 24 as well as the subject-matter of dependent claims 2, 4, 6, 7, 10-12, 15, 18, 19, 28-30 is not novel and does not fulfill the requirements of article 33(2) PCT.

3. The additional features contained in claims 3, 5, 8-9, 13-14, 16-17, 20-27 and 31-32 are novel and fulfill the requirements of article 33(2) PCT. However, such features are banal and would be normal design options for the skilled man in the art.

Therefore, the subject-matter of claims 3, 5, 8-9, 13-14, 16-17, 20-27 and 31-32 does not involve an inventive step and does not fulfill the requirements of article 33(3) EPC.

4. The applicant's attention is drawn to the fact that according to claim 1 (and the description) the connection means can be on or in the holding means. Designs in which the connection means is placed within the holding means are used in the cited documents. It seems that the devices according to these documents show all the technical effects of the claimed device, i.e. sealage, resistance and minimum amount of parts, so that no technical object is solved.

**Re Item VIII**

**Certain observations on the international application**

1. The subject-matter of claims 4, 7, 18 and 21-23 does not seem to be supported by the description (article 6 PCT).

REACTOR VESSEL ARRAY

The present invention is related to a reactor vessel array in  
5 which a number of (different) physical and/or chemical operations can  
be performed, either simultaneously or sequentially.

The desire to perform a multitude of operations in a short time  
is well known to those skilled in the art and a number of systems  
have been proposed, some of which are commercially available, to  
10 decrease the time in which, and possibly the size or scale on which,  
physical and/or chemical operations have to be performed.  
Reference is made, for instance, to the CombiTec System introduced by  
Argonaut Technologies in which use is made of the so-called Reactor  
Cassette.

15 One of the problems still remaining in this rapidly-growing  
area of technology is how to carry out operations either at elevated  
temperature and/or elevated pressure and/or which require the  
handling of reactive components, possibly also at elevated  
temperatures and/or pressures. It has already been proposed in  
20 WO98/36826 (Sinvent AS) to use multi-autoclaves for the combinatorial  
synthesis of zeolites and other materials. The proposed system uses a  
central block containing a number of separated chambers provided with  
top and bottom plates and closing mechanisms which can be integrated  
with the central block.

25 WO-A-98/56 506 relates to systems and methods for parallel  
synthesis of compounds.

WO-A-98/17 391 describes a vessel handling system useful for  
combinatorial chemistry.

EP-A-0 916 397 discloses an apparatus and method used in  
30 multiple, simultaneous synthesis of general compounds.

GB-A-2 291 820 describes a gripping apparatus based on loop of  
pressure modified tubing.

WO-A-99/24 160 relates to a device for holding reaction vessels  
which can be thermally adjusted and agitated.

35 Despite all efforts thus far, there is still much room for  
improvement, in particular with respect to the limited flexibility of  
the current systems. Also, further developments to increase the  
multi-functionality of such multi-reactor systems could well  
contribute to improved performance.

It has now been found that excellent results are obtained when using an improved apparatus as described hereinbelow. The present invention is an apparatus for performing physical and/or chemical operations comprising holding means provided with openings for an array of  
5 reactor vessels; reactor vessels positioned totally or partly within the openings, and connection means capable of connecting the reactor vessels and the holding means, which connection means are located on or in the holding means at the openings in which the reactor vessels are positioned, wherein the connection means are reinforced by the  
10 presence of a support plate containing openings having diameters substantially matching the diameters of the openings in the holding means and being removably fitted to the holding means.

In this basic concept, an array of any number of reactor  
15 vessels, e.g. 4, 6, 12, 24 or even 100 or more, can be held in position and subjected to any number of physical and/or chemical operations which are normally carried out in single reactor vessels. The reactor vessels can have any length provided they can be held in place in the holding means. Since the available reactor volume is of  
20 great importance it is one of the advantages of the present apparatus that the reactors can also be longer than the height of the holding means carrying the openings encompassing the reactor vessels. The vessels can be shorter, equal to or longer than the height of the holding means. Preference is given to reactor vessels protruding  
25 through the bottom of the holding means as this allows maximum flexibility in reactor volume which is highly desirable in short-time, multiple operations. The length of the reactor vessels is determined to some

CLAIMS

1. An apparatus for performing physical and/or chemical operations comprising:  
holding means (3) provided with openings (2) for an array of reactor vessels (1);  
reactor vessels (1) positioned totally or partly within the openings (2); and  
connection means (5) capable of connecting the reactor vessels (1) and the holding means (3), which connection means (5) are located on or in the holding means (3) surrounding the openings (2) in which the reactor vessels (1) are positioned, wherein the connection means (5) are reinforced by the presence of a support plate (6) containing openings (8) having diameters substantially matching the diameters of the openings (2) in the holding means (3) and being removably fitted to the holding means (3).
2. An apparatus according to claim 1, in which the connection means (5) are located in recesses (4) located in or at the surface of the holding means (3).
3. An apparatus according to claim 1 or 2, in which the recesses (4) are tapered in the direction of the openings (2).
4. An apparatus according to any one of claims 1 to 3, in which the connection means (5) are gaskets composed of compressible materials.
5. An apparatus according to claim 4, in which the connection means (5) are in the form of O-shaped rings.
6. An apparatus according to one or more of claims 1-5 in which the openings (8) of the support plate (6) match the openings (2) of the holding means (3) and are provided with notches and/or holes to reduce its weight.
7. An apparatus according to any one of claims 1-6, in which the connection means (5) are in the form of gaskets which together with a



cover means (10) for the array of reactor vessels (1) are capable of creating a leak-tight seal when the cover means (10) is removably fitted to the holding means (3).

8. An apparatus according to claim 7, in which the gaskets (5) are in the form of O-rings which, together with a cover means (10) for an array of cylindrical reactor vessels (1), are capable of creating a leak-tight seal when the cover means (10) is removably fitted to the holding means (3).

9. An apparatus according to claim 7, in which the cover means (10) comprises a solid plate on top of the surface of the holding means (3).

10. An apparatus according to claim 9, in which the cover means (10) comprises a plate matching the openings (2) of the holding means (3) whilst the openings (11) of the cover means (10) are closed with permeable material (9).

11. An apparatus according to claim 7, in which the cover means (10) is composed of a solid plate having openings (11) matching at most the diameters of the openings (2) of the holding means (3) whilst septa (9) covering the tops of the reactor vessels (1) are present between the surface of the holding means (3) and said cover means (10).

12. An apparatus according to claim 7, in which the cover means (10) comprises a plate having openings (11) having diameters matching at most the diameters of the openings (2) of the holding means (3), the openings being provided with pressure relief valves (13).

13. An apparatus according to claim 7, in which the cover means (10) comprises a plate having openings (11) having diameters of at most the diameters of the openings (2) of the holding means (3), the openings being provided with condensing means.

14. An apparatus according to claim 7, in which the cover means (10) comprises a plate having openings (11) having diameters matching at most the diameters of the openings (2) of the holding means (3), the openings being provided with filtration means.

15. An apparatus according to claim 7, in which the cover means (10) comprises a plate having openings (11) having diameters matching at most the diameters of the openings (2) of the holding means (3), the openings being provided with manifolds.
16. An apparatus according to claim 7, in which the cover means (10) comprises a plate having openings (11) having diameters matching the openings (2) of the holding means (3), the openings being provided with stirrer means.
17. An apparatus according to claim 16, in which the stirrer means are provided with shafts allowing them to be operated by a central motor.
18. An apparatus according to any of the preceding claims, in which the reactor vessels (1) are made of glass or steel.
19. An apparatus according to claim 18, in which the bottoms of the reactor vessels (1) protrude through the bottom of the holding means (3).
20. An apparatus according to any one of the preceding claims, in which the holding means (3) are made of steel.
21. An apparatus according to claim 5 or 6, in which the support plate (6) is made of the same material as the holding means (3).
22. An apparatus according to any one of claims 7-21, in which the cover means (10) is made of the same material as the holding means (3).
23. An apparatus according to claim 22, in which the support plate (6) or the cover means (10) are made of the same material as the holding means (3).
24. A process for performing physical and/or chemical operations in which use is made of an apparatus according to any one of the preceding claims.

25. A process according to claim 24, in which a mixing operation is performed in which use is made of an orbital shaker.
26. A process according to claim 25, in which use is made of rod-shaped stirrers present in the reaction vessels (1) during mixing.
27. A process according to claim 24, in which a mixing operation is performed in which use is made of ultrasound to initiate and maintain mixing.
28. A process according to claim 24, in which a heating operation is performed.
29. A process according to claim 28, in which the heating operation is performed together with a mixing operation.
30. A process according to claim 29, in which a cooling operation is performed.
31. A process according to claim 24, in which a centrifugal operation is performed.
32. A process according to claim 24, in which an evaporation operation is performed.



European Patent  
Office

# EUROPEAN SEARCH REPORT

Application Number  
EP 99 30 5017

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	WO 98 56506 A (ARGONAUT TECHNOLOGIES, INC.) 17 December 1998 (1998-12-17) * abstract * * page 11, line 16 - page 2, line 4 * * page 14, line 10 - line 14 * * figure 3 *	1,4,19, 20,25	B01J19/00 B01L9/06
A		2,5-17, 21-24, 29-33	
X	WO 98 17391 A (ELI LILLY AND COMPANY) 30 April 1998 (1998-04-30) * abstract * * page 6, line 28 - page 7, line 13 * * page 8, line 1 - page 9, line 7 * * page 10, line 15 - line 23 * * page 13, line 1 - line 12 * * page 13, line 29 - line 36 * * figures 1,2,7 *	1-5,25	
A		19-21,26	
X	EP 0 916 397 A (ROHM AND HAAS COMPANY) 19 May 1999 (1999-05-19) * abstract * * page 1, line 47 - line 50 * * page 4, line 28 - line 54 * * page 5, line 53 - line 56 * * page 6, line 23 - line 25 * * page 7, line 13 - line 20 * * page 8, line 2 - line 17 * * figures 2,3,6,8 *	1,4,5, 19,20, 25,29-33	TECHNICAL FIELDS SEARCHED (Int.Cl.7) B01J B01L
A		2,6, 8-18, 21-24,27	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 17 December 1999	Examiner Stevnsborg, N
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

1

EPO FORM 1503 03.82 (P04C01)



European Patent  
Office

# EUROPEAN SEARCH REPORT

Application Number  
EP 99 30 5017

## DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	GB 2 291 820 A (MERCK & CO. INC.) 7 February 1996 (1996-02-07) * the whole document *	1,2,4,25	
A	EP 0 635 713 A (ZYMARK CORPORATION) 25 January 1995 (1995-01-25) * abstract; figure 2 *	27	
A	WO 99 24160 A (CHEMSPEED, LTD.) 20 May 1999 (1999-05-20)		
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 17 December 1999	Examiner Stevnsborg, N
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

1  
EPO FORM 1503 03.82 (P&C01)

# ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO.

EP 99 30 5017

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on  
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

17-12-1999

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9856506 A	17-12-1998	AU 8256098 A	30-12-1998
		AU 1107099 A	10-05-1999
		WO 9920395 A	29-04-1999
WO 9817391 A	30-04-1998	US 5785927 A	28-07-1998
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		EP 0934119 A	11-08-1999
EP 916397 A	19-05-1999	JP 11236339 A	31-08-1999
GB 2291820 A	07-02-1996	US 5536056 A	16-07-1996
EP 635713 A	25-01-1995	DE 69405930 D	06-11-1997
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		HK 1003845 A	06-11-1998
WO 9924160 A	20-05-1999	AU 7518698 A	04-01-1999
		AU 7518798 A	04-01-1999
		AU 9733398 A	31-05-1999
		WO 9857739 A	23-12-1998
		WO 9857740 A	23-12-1998

# INTERNATIONAL SEARCH REPORT

Internal Application No

PCT/GB 00/02501

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 7 B01J19/00 B01L9/06

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 B01J B01L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 98 56506 A (ARGONAUT TECHNOLOGIES, INC.) 17 December 1998 (1998-12-17) abstract page 11, line 16 -page 2, line 4 page 14, line 10 - line 14 figure 3	1, 4, 19, 20, 25, 34
A	---	2, 5-17, 21-24, 29-33
	-/-	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

\* Special categories of cited documents:

\*A\* document defining the general state of the art which is not considered to be of particular relevance

\*E\* earlier document but published on or after the international filing date

\*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

\*O\* document referring to an oral disclosure, use, exhibition or other means

\*P\* document published prior to the international filing date but later than the priority date claimed

\*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

\*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

\*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

\*S\* document member of the same patent family

Date of the actual completion of the international search

12 October 2000

Date of mailing of the international search report

19/10/2000

Name and mailing address of the ISA

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Authorized officer

Stevnsborg, N

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 00/02501

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>WO 98 17391 A (ELI LILLY AND COMPANY)  30 April 1998 (1998-04-30)  abstract  page 6, line 28 - page 7, line 13  page 8, line 1 - page 9, line 7  page 10, line 15 - line 23  page 13, line 1 - line 12  page 13, line 29 - line 36  figures 1,2,7</p>	1-5,25, 34
A	---	19-21,26
X	<p>EP 0 916 397 A (ROHM AND HAAS COMPANY)  19 May 1999 (1999-05-19)  abstract  page 1, line 47 - line 50  page 4, line 28 - line 54  page 5, line 53 - line 56  page 6, line 23 - line 25  page 7, line 13 - line 20  page 8, line 2 - line 17  figures 2,3,6,8</p>	1,4,5, 19,20, 25,29-34
A	---	2,6, 8-18, 21-24,27
X	<p>GB 2 291 820 A (MERCK &amp; CO. INC.)  7 February 1996 (1996-02-07)  the whole document</p>	1,2,4, 25,34
A	<p>EP 0 635 713 A (ZYMARK CORPORATION)  25 January 1995 (1995-01-25)  abstract; figure 2</p>	27
A	<p>WO 99 24160 A (CHEMSPEED, LTD.)  20 May 1999 (1999-05-20)</p>	



# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 00/02501

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9856506	A	17-12-1998	AU 8256098 A	30-12-1998
			EP 1005395 A	07-06-2000
			AU 1107099 A	10-05-1999
			EP 1028807 A	23-08-2000
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			AU 715616 B	03-02-2000
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			HK 1003845 A	06-11-1998
			US 6060024 A	09-05-2000
WO 9924160	A	20-05-1999	AU 7518698 A	04-01-1999
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			WO 9857739 A	23-12-1998
			WO 9857740 A	23-12-1998
			EP 0991464 A	12-04-2000
			EP 0973607 A	26-01-2000
			EP 1027148 A	16-08-2000

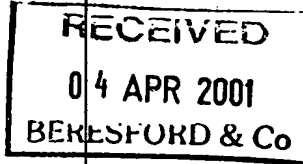
# PATENT COOPERATION TREATY

DW

From the:  
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

BERESFORD, Keith D.L.  
Beresford & Co.  
2-5, Warwick Court  
High Holborn  
London WC1R 5DJ  
GRANDE BRETAGNE



## PCT

WRITTEN OPINION

(PCT Rule 66)

Date of mailing (day/month/year) 02.04.2001	
Applicant's or agent's file reference 5348999	<b>REPLY DUE</b> within 3 month(s) from the above date of mailing
International application No. PCT/GB00/02501	International filing date (day/month/year) 23/06/2000
Priority date (day/month/year) 25/06/1999	
International Patent Classification (IPC) or both national classification and IPC B01J19/00	
Applicant AVANTIUM INTERNATIONAL B.V.	

1. This written opinion is the first drawn up by this International Preliminary Examining Authority.
2. This opinion contains indications relating to the following items:
  - I ☒ Basis of the opinion
  - II ☐ Priority
  - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
  - IV ☐ Lack of unity of invention
  - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
  - VI ☐ Certain document cited
  - VII ☒ Certain defects in the international application
  - VIII ☒ Certain observations on the international application

3. The applicant is hereby invited to reply to this opinion.

**When?** See the time limit indicated above. The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.2(d).

**How?** By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

**Also:** For an additional opportunity to submit amendments, see Rule 66.4.  
For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 bis.  
For an informal communication with the examiner, see Rule 66.6.

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.

4. The final date by which the international preliminary examination report must be established according to Rule 69.2 is: 25/10/2001.

Entered By:

Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer / Examiner Nazario, L Formalities officer (incl. extension of time limits) Michaleczek, N Telephone No. +49 89 2399 7254
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**I. Basis of the opinion**

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed"*):

**Description, pages:**

1-15 as originally filed

**Claims, No.:**

1-34 as originally filed

**Drawings, sheets:**

1/3-3/3 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N) Claims 1-9, 11-14, 16-20, 25, 27, 29-31, 34

Inventive step (IS) Claims 1-34

Industrial applicability (IA) Claims

2. Citations and explanations  
see separate sheet

**VII. Certain defects in the international application**

The following defects in the form or contents of the international application have been noted:  
see separate sheet

**VIII. Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:  
see separate sheet

**R l t m V**

**Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Reference is made to the following documents:

D1: WO-A-98 56506

D2: WO-A-98 17391

D3: EP-A-0 916 397

D4: GB-A-2 291 820

D5: WO-A-99 24160

2. D1-D5 disclose devices for holding vessels which comprise holding means with openings, connecting means and reactor vessels. These devices are used in a variety of processes, such as chemical synthesis. The disclosed devices also include connection means located in recesses (e.g. gaskets or O-rings) which form leak-tight seals. The reactors vessels are disclosed as being made out of glass and the devices can carry out heating, mixing and cooling processes. D1 further discloses a support plate, cover means and manifolds. D3 discloses cover means, as well as, relief valves, manifolds, condensing means and stirrer means. (D1: abstract, page 1, lines 21-26, page 10, line 31 to page 13, line 20, page 14, lines 10-13, figures 1, 3, 7, 17; D2: abstract, page 1, lines 2-6, page 6, line 28 to page 7, line 13, page 8, line 1 to page 9, line 33, page 13, lines 1-36, page 18, lines 4-16, figures 1, 2, 5, 7; D3: abstract, page 1, lines 5-7 and 47-50, page 4 line 28 to page 5, line 56, page 6, lines 22-25, page 7, lines 13-20, page 8, lines 2-17, figures 2, 3, 6, 8; D4 abstract, page 1, lines 5-20, page 2, lines 1-22, figures; D5: abstract, page 1, lines 4-12, page 3, lines 10-19, page 9, line 10 to page 10, line 27, figure 2).

Therefore, the subject-matter of independent claims 1, 25 and 34 as well as the subject-matter of dependent claims 2-9, 11-14, 16-20, 27, 29-31 is not novel and does not fulfill the requirements of article 33(2) PCT.

3. The additional features contained in claims 10, 15, 21-24, 26, 28, 32, 33 are novel and fulfill the requirements of article 33(2) PCT. However, such features are banal and would be normal design options for the skilled man in the art.

Therefore, the subject-matter of claims 10, 15, 21-24, 26, 28, 32, 33 does not involve an inventive step and does not fulfill the requirements of article 33(3) EPC.

4. The applicant should indicate in the letter of reply the difference of the subject-matter of any new claim vis-à-vis the state of the art and the significance thereof towards the requirement of inventive step. In this connection, the problem to be solved should be clearly stated, as well as the specific features of its solution and why the solution is deemed to be inventive.

**Re Item VII**

**Certain defects in the international application**

1. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the documents D1-D5 is not mentioned in the description, nor are these documents identified therein.

**Re Item VIII**

**Certain observations on the international application**

1. The subject-matter of claims 4, 8, 19, 22-24 and 34 does not seem to be supported by the description (article 6 PCT).